Small Business Innovation Research/Small Business Tech Transfer

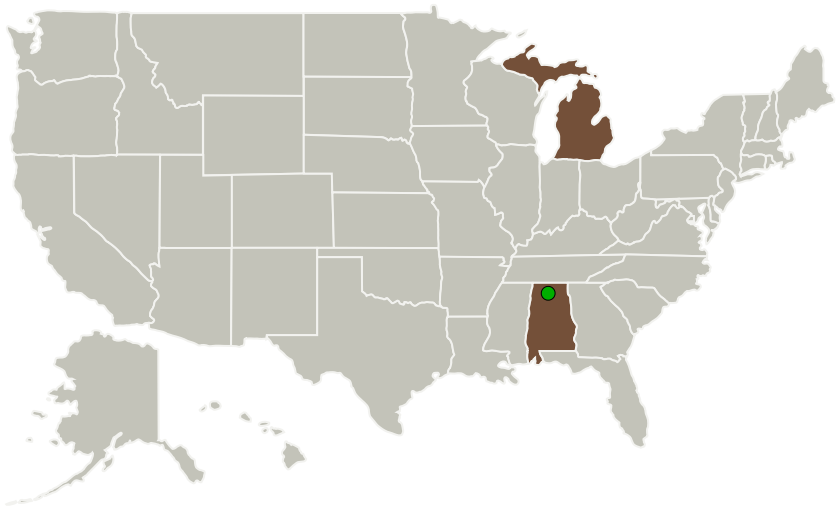
Volcanic Ash Detection Using Raman LIDAR: "VADER", Phase I

Completed Technology Project (2013 - 2013)

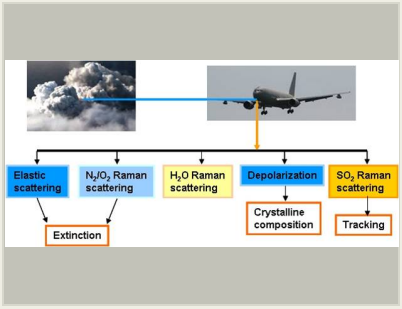
Project Introduction

Volcanic ash is a significant hazard to aircraft engine and electronics and has caused damage to unwary aircraft and disrupted air travel for thousands of travelers, costing millions of dollars. Michigan Aerospace Corporation (MAC) proposes to demonstrate the concept feasibility of a Raman Light Detection and Ranging (LIDAR) system to obtain real-time information from volcanic ash clouds, to be named VADER (Volcanic Ash DEtection Raman LIDAR). The instrument will be designed to operate from an airborne platform, and as such, will be compact and light weight. This approach benefits from returning real-time measurements, in contrast to sampling methods (impactors) that require post-mission analysis. This project will utilize MAC's extensive heritage of rugged LIDAR system design and construction.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Michigan Aerospace Corporation	Lead Organization	Industry	Ann Arbor, Michigan
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama



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Primary U.S. Work Locations	
Alabama	Michigan

Project Transitions

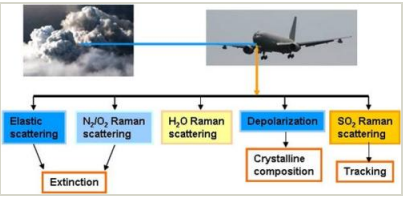
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138564)*

Images



Project Image
Volcanic Ash Detection Using Raman LIDAR: "VADER"
(https://techport.nasa.gov/image/133346)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Michigan Aerospace Corporation

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Dominique Fourguette

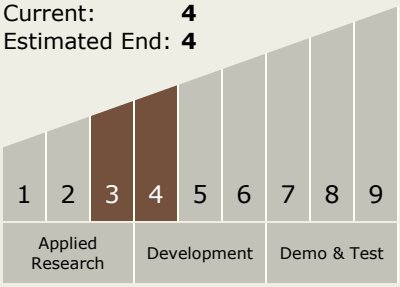
Co-Investigator:
Dominique Fourguette

Volcanic Ash Detection Using Raman LIDAR: "VADER", Phase I

Completed Technology Project (2013 - 2013)

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System